

CONTROL ID: 2566691

TITLE: BLADED TERRAIN ON PLUTO: POSSIBLE ORIGINS AND EVOLUTIONS

ABSTRACT BODY:

Abstract (2,250 Maximum Characters): Pluto's Bladed Terrain (centered roughly 20°N, 225°E) covers the flanks and crests of the informally named Tartarus Dorsa with numerous roughly aligned blade-like ridges oriented ~North-South; it may also stretch considerably farther east onto the non-close approach hemisphere but that inference is tentative. Individual ridges are typically several hundred meters high, and are spaced 5 to 10 km crest to crest, separated by V-shaped valleys. Many ridges merge at acute angles to form Y-shape junctions in plan view. The principle composition of the blades themselves we suspect is methane or a methane-rich mixture. (Methane is spectroscopically strongly observed on the optical surfaces of blades.) Nitrogen ice is very probably too soft to support their topography. Cemented mixtures of volatile and non-volatile ices may also provide a degradable but relief supporting "bedrock" for the blades, perhaps analogous to Callisto. Currently we are considering several hypotheses for the origins of the deposit from which Bladed Terrain has evolved, including aeolian disposition, atmospheric condensation, updoming and exhumation, volcanic intrusions or extrusions, crystal growth, among others. We are reviewing several processes as candidate creators or sculptors of the blades. Perhaps they are primary depositional patterns such as dunes, or differential condensation patterns (like on Callisto), or fissure extrusions. Or alternatively perhaps they are the consequence of differential erosion (such as sublimation erosion widening and deepening along cracks), variations in substrate properties, mass wasting into the subsurface, or sculpted by a combination of directional winds and solar isolation orientation. We will consider the roles of the long-term increasing solar flux and short periods of warm thick atmospheres. Hypotheses will be ordered based on observational constraints and modeling to be presented at the conference.

CURRENT CATEGORY: Pluto System

CURRENT : None

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